GET TO THE POINT!

Quick Tips to Improve Technical Writing

with ideas from ENGINEERED WRITING, M. J. Murray
and H. Hay-Roe, Pennwell Books, 2nd Ed, 1986

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Undergraduate Seminar

Robert B. Wiggins

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How to Begin

- Don't start writing sentences!

- That puts style before content.

- 80% Content / 20% Style

- Writing is a process, like solving equations

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Technical Writing Plan

- Consider the Audience
- Determine the "essential message"
- Outline
- Assemble graphics
- Expand Outline
- Write, edit

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Your Audience

- Who are they?
  - Technical peers
  - Management

- What do you want them to do?
  - Management controls assets: equipment, time
  - Your job is to <u>tell them</u> how to allocate assets.

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Your Audience

- Is often multilevel, requiring different levels of detail:
  - Summary for management
  - Body for your technical peers
  - Appendix for specialists

- All readers want
  - accurate, complete information
  - presented clearly and concisely

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The Essential Message

- Your key finding and the action you want taken.

- Abandon the "suspense format"
  - Put your key finding up front,
  - then provide supporting data.

- This is not fiction; we don't need to build to a climax. Get to the point!

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Contents of the Essential Message

- **What**'s the News?

- **Why** is it important?   (briefly)

- **How** did you find out?   (briefly)

- Now **what**?

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Example of an Essential Message

A 5% yield increase on all current products can be attained by plasma cleaning prior to wire bonding. These results were obtained on comparative sample lots fabricated in the R&D lab. Engineering recommends the expenditure of $10,000 to add plasma cleaning to one production line for evaluation.

- **What**'s the News?
- **Why** is it important?
- **How** did you find out?
- Now **what?**   3 @ 15 w/s

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OUTLINING FOR STRUCTURE

THE SINGLE MOST IMPORTANT STEP IN WRITING

- Beginning: The essential message.

- Middle   Details of what you did.

- End: Restate conclusions,
                  Make recommendations.

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THE MIDDLE, OR BODY

- What you did and how you did it
  - In logical groups (not always chronological)
  - Were there any dead ends?
  - **Remember that science must be repeatable**

- Quantify the results graphically.

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ASSEMBLE GRAPHICS

- Graphs, block diagrams, photos

- Your audience will look at the pictures first

- This may be all that they "read"

- Tell the whole story with the pictures and captions (interpret the data).

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END STRUCTURE

- What do the results mean?

- Data must support your conclusions.
  - Alternate interpretations?
  - Are there any "holes"? Additional work needed?

- What do you want your audience to do?
  - Take action
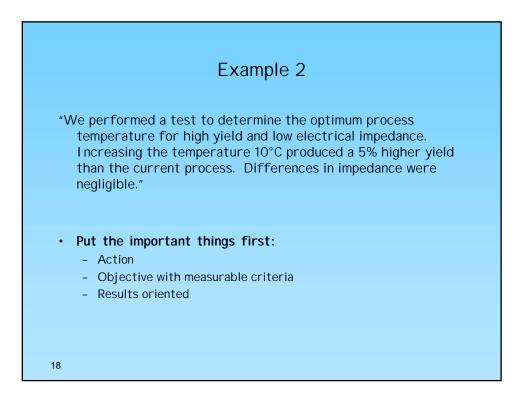 - Change opinion

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INCREASE DETAIL, THEN WRITE

- Expand outline with increasing detail.
  - 3 or 4 levels will create a logical structure.

- Now write sentences!

- Every paragraph should have a topic sentence. Go from general to specific.

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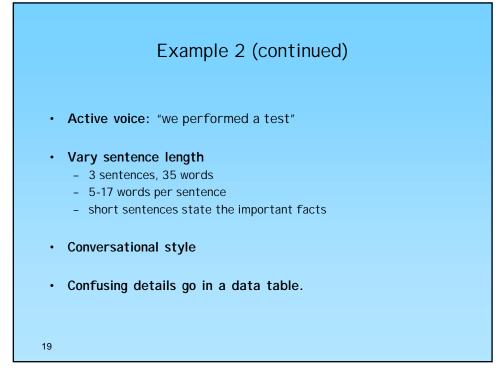**ALL WRITING NEEDS STRUCTURE**

- Short:
  - lack of structure often obscures intent
  - Put the essential message up front.

- Longer
  - format is often given (thesis, technical journal)
  - often includes abstract or executive summary

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STYLE

- Write the way you talk; don't get wordy.

- Use active voice whenever possible.

- Vary sentence length

- Use tense (past/present) appropriately.

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Example 1

"Adequate statistical samples of parts fabricated immediately before and after the change in process temperature were gathered for a comparison of yield loss and electrical impedance."

- **passive voice** "samples … were gathered"

- One sentence, 26 words

- Objective is stated last (after justifying test methods)

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Example 2

"We performed a test to determine the optimum process temperature for high yield and low electrical impedance. Increasing the temperature 10°C produced a 5% higher yield than the current process. Differences in impedance were negligible."

- **Put the important things first:**
  - Action
  - Objective with measurable criteria
  - Results oriented

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Example 2 (continued)

- **Active voice:** "we performed a test"

- **Vary sentence length**
    - 3 sentences, 35 words
    - 5-17 words per sentence
    - short sentences state the important facts

- **Conversational style**

- **Confusing details go in a data table.**

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Example 3: verb tenses

"Einstein <u>demonstrated</u> that matter and energy <u>are</u> interchangeable.

Past tense to describe previous actions.

Present tense for facts which will always be true.

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SUMMARY

- Content & structure are more important than style.

- Start with an outline
  - Put the essential message first
    - What's the News, what's in it for them
  - Tell why and how you found out.
  - Tell the audience what to do.

- Write in a conversational style

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About the Author

Robert B. Wiggins is President of Quartzdyne, Inc., the world's leading manufacturer of precision pressure sensors for oil-and-gas exploration and production.

Mr. Wiggins received two bachelor's degrees from the University of Utah. In 1972, he received a BA in English, after which he taught school and served in the US Army. He returned to the U, earning a BS in Mechanical Engineering in 1980.

Since 1981, Bob has been developing quartz-resonator sensors at Quartzdyne, as a Design Engineer, Project Manager, and Vice President of Engineering and Marketing. He became President of Quartzdyne in July 1999.

Bob holds five patents for quartz-resonator sensors for measuring pressure, temperature, and weight. He is the co-author of more than 15 technical articles on quartz-resonator sensors. Mr. Wiggins is a Senior Member of the Institute of Electrical and Electronic Engineers, a Member of the American Society of Mechanical Engineers, and a Member of the Society of Petroleum Engineers. He serves on the University of Utah College of Engineering's National Advisory Coucil.

Quartzdyne specializes in accurate, high-resolution, low-drift measurement of pressure to 30,000 psi, at temperatures to 400° F, in high shock and vibration environments. Quartzdyne is based in Salt Lake City; its primary markets are oilfield service companies and oilfield tool builders in Great Britain, France, Alberta, Canada, and Houston, Texas. Dover Corporation acquired Quartzdyne in January 1998.

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